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Chapter 4

RELIABILITY OF PARENTAL REPORTS ON CHILDRENS' USE OF PHYSICIAN SERVICES

4.1 Introduction

The use of health care services and its determinants have been widely studied. Reliable data on the use of services are essential in these studies as all other data are related to them to determine the influence of different factors on use.
In measuring use of health care services, data usually are gathered by using one of the following sources: physician's medical records, hospital, clinic or insurance records, self-administered diaries, personal interviews or self-administered questionnaires. Each of these methods has its advantages and disadvantages [1].

The medical record is supposed to be a valid source of data on use of physician- and hospital services [2, 3]. However, information concerning a patient can be spread over several records, checking the records is very time-consuming and information in the medical record can be difficult to interpret when not kept in a structured manner [4].
Personal interviews and postal questionnaires are less costly and less time-consuming methods. Both methods meet the same problems. Accuracy of recall is the major problem here [5]. Generally, there is a tendency towards under-reporting. The time interval since exposure, the degree of detail, personal characteristics, significance of events, social desirability and interviewing technique are all known influencing factors. Differential recall, participants being more motivated or aware of important factors by experience than non-participants, is another major problem.

Most studies on health care services use are based on data obtained from questionnaires. Little attention has been paid to the reliability and validity of data on health care services use derived from questionnaires, compared to data obtained by other methods. Harlow and Linet reviewed studies comparing questionnaire data with data from medical records. Except for hospitalisation, surgery and radiation, no other health services use data were examined in the studies reviewed [6].

In this study data on visits to a General Practitioner (GP) as well as data on visits to medical specialists by children aged 1 - 10 years obtained from postal self-reported questionnaires to the parents will be compared with data derived from these children's medical records. These two groups were selected while in further

studies the determinants of health care use in children will be investigated, especially looking for differences between children using specialist's services and children only using GP's services or not using any health care services at all. Aim of this study is to evaluate the possibility of obtaining reliable data on use of health care services in childhood by questionnaires. Reliable data on health care use are necessary to evaluate the importance of different determinants of use of services and to search for factors that influence the decision made by parents whether or not to search for professional help in case of symptoms of their child.
Obtaining reliable results of health care use in children can be complicated by the fact that the parents are the respondents on the use of services of their child. However, reports are not expected to be less reliable than the results presented in the limited number of other studies in adult populations. Most parents are very well aware of their child's health and accompany their child on visits. Nevertheless, it is expected that collection of data on visits to medical specialist will be more difficult than collection of GP-visits. We estimate there will be a small number of visits by the child to other specialists and even other hospitals outside the Paediatric Outpatients Clinic (POC) where we collected our data without reference to it in the medical record in the POC. Visits to an attending GP in evenings or weekends are supposed to be reported by that GP to the patient's own GP afterwards, here also some loss of information in the medical record is expected.

In our view the most important advantage of collecting data by self-reported questionnaires is that also it makes it possible also to reach parents of children that did not recently visit a physician. Comparing characteristics of parents and children who did not use health care services in presence of a child's symptoms with those who did, can give further insight into the determinants of health care services use in common and in childhood specifically. It is important to prove that self-reported non-use is confirmed by absence of registered visits, and that therefore self-reported questionnaires are a reliable method to measure non-use.

4.2 Methods

Two groups are studied. The first group is a random sample of 70 children aged 1-10 years taken from one General Practitioners' files. The second group is a random sample of 108 children of the same age visiting a Paediatric Outpatients Clinic. Only one child per family is eligible. Parents received a questionnaire eliciting information about socio-demografic background, parental use of

health care services and ideas of the parent on health of children and medical care for children in common. These data were collected for further studies on the determinants of use of health care services in childhood. Every three months the participants were sent a short questionnaire about the child's use of health care services in the previous three months, for a total period of nine months. These questionnaires were announced in the first one, trying to make the participants more aware of the number and moment of visits. After these nine months the medical records of the children was searched for the number of visits made to the General Practitioner in the first group and to the Paediatrician or other specialists in the second group. The number of visits to a medical specialist was asked for in the questionnaire, it was only possible to check the paediatric medical record of the participants. Only when reports or notes were found in that record on visits to other specialists those visits were added to the number of visits to the paediatrician. Emergency Room visits were always reported in the medical record.

4.3 Statistical methods

Kappa coefficients are calculated to estimate the strength of agreement between data obtained from the two sources. Landis and Koch [7] suggested the classification of kappa values that will be used (kappa values <0.40 represent poor to fair agreement, 0.40-0.60 moderate agreement, 0.60-0.80 substantial agreement, and 0.80-1.00 almost perfect agreement). Others suggested that for continuous data either the mean of the difference or the correlation coefficient might be better measures of agreement when validity is being evaluated [8]. These measures will therefore also be presented. P-values <0.05 are considered significant.

For estimating validity of the questionnaire on use or non-use of GP-services sensitivity and specificity are calculated using registration in the medical record as the 'gold standard'.

4.4 Results

Complete data on the 9-month period are obtained from 150 out of the 178 participants (84%). In the GP-group 61 out of 70 parents (87%) reported health care visits of their child for the complete 9 months, in the POC-group 89 out of 108 parents (82%). Comparison of the number of visits to a general practitioner or a specialist according to the questionnaire and to the medical record,

was possible for all participants. The results of the GP-group are given in table 4.1.

The mean number of visits to the GP in this nine-month period is 1.43 (SEM 0.29, range 0-12) reported in the questionnaire and 1.70 (SEM 0.36, range 0-15) when checked in the medical record. The mean of difference being 0.28 (95% CI -0.12 – 0.67, p=0.16). Kappa statistics for comparison of reported and registered GP-visits are moderate (0.45, 95%CI 0.29 – 0.60, p<0.001), the correlation coefficient was high (0.83, p<0.001). Overreporting (9/61, 15% of reports) as well as underreporting (15/61, 25% of reports) occurs, 60% of reports are in accordance with the registered number of visits (figure 4.1).

Table 4.1 Number of visits to GP according to questionnaire and medical record.

		GP-visits questionnaire[a]						
	Number	*0*	*1*	*2*	*3*	*4*	*>4*	Total
GP-visits	*0*	**23**	4					27
In	*1*	5	**7**	1	1			14
Medical	*2*		2	**1**				3
Record[b]	*3*		2	2	**3**	1		8
	4				2	**1**	2	5
	>4		1			1	**2**	4
Total		28	16	4	6	3	4	61[c,d]

a. mean number of visits questionnaire: 1.43 (SEM 0.29, range 0-12)
b. mean number of visits medical record: 1.70 (SEM 0.36, range 0-15)
c. difference of means: 0.28 (95%CI: -0.12 – 0.67, p=0.16)
d. R=.83, kappa=.45 (both p<.001)

A mean of 1.4 visits (range 1-2) is overreported, mean underreporting is 1.9 visits (range 1-9). The results of the GP-group are used, using the registered visits in the medical record as the 'gold standard', to determine sensitivity and specificity of the questionnaire-data for use and non-use. Sensitivity is high (0.88, 95%CI: 0.80-0.96) as well as specificity (0.82, 95%CI: 0.72-0.92), the kappa-value for the categorised data shows substantial agreement (0.70, p<0.001).

Figure 4.1. Difference between GP-visits according to medical record and questionnaire (percentages of patients).

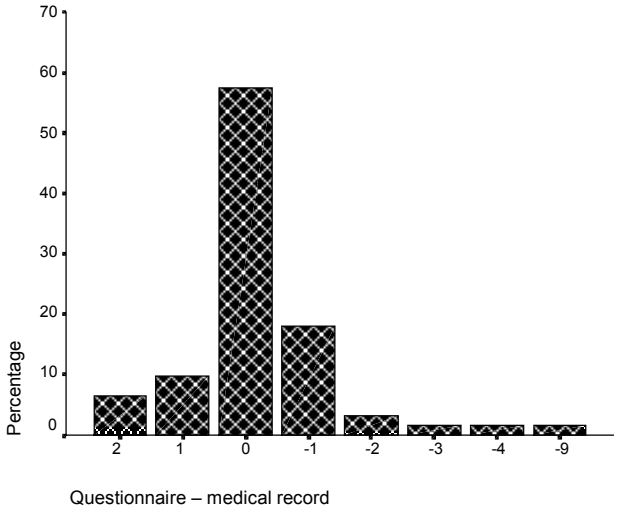


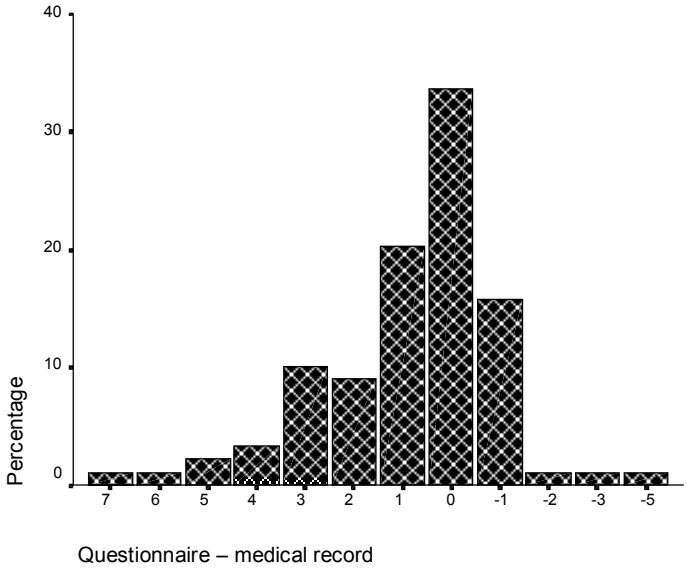
Table 4.2 Number of visits to specialist according to questionnaire and medical record.

		specialist-visits questionnaire [a]									
	Number	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*>7*	Total
Specialist-visits	*0*	**12**	2	2	2	1					19
In	*1*	3	**5**	5	1	1					15
Medical	*2*		4	**4**	5	3	2				18
Record[b]	*3*	1		2	**1**	3	1	1	1	1	11
	4				4	**3**			1	3	11
	5					1	**1**	1	1		4
	6							**2**	1	1	4
	7								**2**	3	5
	>7				1			1			2
Total		16	11	13	14	12	4	5	6	8	89 [c,d]

a. mean number of visits questionnaire: 3.18 (SEM 0.27, range 0-11)
b. mean number of visits medical record: 2.51 (SEM 0.23, range 0-8)
c. difference of means: -0.67 (95%CI: -1.02 – -0.33, p<.001)
d. R=.78, kappa=.23 (both p<.001)

In the POC-group (table 4.2) the mean number of visits to a specialist in this nine-month period is 3.18 (SEM 0.27, range 0-11) reported in the questionnaire and 2.51 (SEM 0.23, range 0-8) when checked in the medical record, the mean of difference being -0.67 (95%CI -1.02 - -0.33, p<0.001). The kappa value for agreement between the uncategorised data is fair (0.28, 95%CI 0.12 – 0.34, p<0.001), the correlation coefficient good (0.78, p<0.001). Reports on the use of services in the nine-month period are in accordance with registered use in 34% of cases (30/89)(figure 4.2). 19% (17/89) underreported a mean of 1.4 visits (range 1-5), and 47% (42/89) overreported a mean of 2.3 visits (range 1-7).

Figure 4.2. Difference in reports of specialist's visits between medical record and questionnaire (percentage of patients).



4.5 Discussion

The number of physician visits is the most used indicator in studies on the use of health care services. Generally these studies use questionnaires as the source of data. Studies on reliability of the reported measures of health care use, especially the number of physician visits, are rare.

In this study the use of health care services of two specific groups of children was reported by their parents. These reports are compared to the registered use in the medical record.
In the GP-group there is no significant difference in the mean number of reported and registered visits. The correlation coefficient is high. This indicates that the reported visits give a reliable impression of the degree of use of GP-services. The kappa-value is moderate, but this is on uncategorised data. Kappa-values are higher when fewer categories are used, as shown by the good value for the agreement of use and non-use in questionnaire and medical record. The questionnaire showed a good sensitivity and specificity for discriminating on use or non-use of GP-services in the studied period. While in The Netherlands every patient only has one single GP, data from these medical records are expected to be reliable and can be used as a gold standard. Nevertheless, it is possible though that a small number of GP-visits in evenings or weekends is missed in the registration.
Over- and underreporting was mostly small, a few patients with a comparatively high number of registered visits underreported up to nine visits. Even then these patients are high-users when self-reported use is analysed. Influence of over- and underreporting in the GP-group therefore is expected to be small in further analyses of determinants of health care use based on self-reported number of visits.

In the POC-group there is a strong correlation between reported and registered number of visits. There is little exact agreement, under- or overreporting occurring in 66% of cases. Most studies have to deal with underreporting of use by the participants compared to the medical record as was the tendency in our GP-group. However, the parents in the POC-group tended to overreport their children's use of services. Differences between reported use and registered use are significant here. As it was only possible to check on the medical records of the patients own Paediatrician in the POC-group, the number of visits according to the medical record is likely to be an underestimation of the real number of visits to a medical specialist. On the other hand, the repeated 3-monthly questionnaires may have led to better awareness of physician visits and more reliable reports. In some cases there might have been overlap by reporting visits twice in subsequent questionnaires because of telescoping.

Inaccurate recall but also inaccurate data-collection from available medical records may bias study-results. Often the medical record is used as gold standard although not always accuracy can be guaranteed. This study confirms the difficulties outlined in the

introduction in using the medical record as the source of data on use of services, in the POC-group data of some children are spread over several records and the reviewed records are sometimes difficult to interpret. In case of overreporting the reported use may therefore be closer to reality than the registered use.
Cleary and Jette studied accuracy of the reported use of medical care in a one-year period [9]. The average difference between reported and actual physician utilisation in their study was only 0.05 visits. Over 10% had a discrepancy of more than four visits, 38% of recall was accurate. Accuracy in this study in the POC-group is comparable (34%), in the GP-group much better though (57%). In both groups discrepancy between reported and registered visits is smaller compared to the study of Cleary and Jette. This study confirms their findings that reporting error is influenced primarily by amount of health care utilisation and source of care, as differences in reports and registration increased in increasing use and there also is a difference between the GP- and POC-group.

In studying determinants of use of health care services the relationship between utilisation and other variables is more important than the absolute level of utilisation. When the degree of over- or underreporting is highest with respondents showing relatively high use, these erratic reports have relatively little influence. The real numbers of visits, although not correctly reported, are in most cases still high compared to other participants. Also the importance of this incorrect reporting proves to be of little influence when data are categorised into use and non-use. When categorised into use and non-use sensitivity, specificity and kappa-value of the questionnaire data are high and comparable to other reports that compared reliability of diary- and interview-data to GP-registration [3].

This study shows that, both in General Practice and in Paediatric Outpatient Clinic, a reliable impression for research purposes can be obtained on use of health care services in childhood during a longer period by repeatedly questioning parents on their children's use of health care services by self-administered questionnaires. Although over- and underreporting is observed, this is not expected to have a strong impact on reliability of results when studying determinants related to the degree of use of health care services and differences in use and non-use of health care services. Reliable data on children who did not recently use services can be obtained by this method of questioning. Using announced repeated questionnaires can lead to a low degree of loss in follow-up and also higher accuracy of reports. Higher accuracy of data will probably help in further exploring the determinants of use of health

care services in childhood. Further development of methods for obtaining data on use of health care services is needed. Inaccuracies due both to inadequate reporting and to registration problems have to be reduced. In these methods the possibility of obtaining data on non-users needs to be included.

4.6 Literature

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